

April 16, 2002

Mr. Sam Becker, Acting Division Director
Water Quality Protection Division
U.S. EPA Region 6, 6WQ-EW
1445 Ross Avenue
Dallas, TX 75202-2733

RE: Revised Delisting of Dugdemona River for Organic Enrichment/Low Dissolved Oxygen

Dear Mr. Becker:

The Louisiana Department of Environmental Quality (LDEQ) hereby revises its request that Dugdemona River, headwater to junction with Big Creek (subsegment 081401), be removed from EPA's Court Ordered § 303(d) list of impaired waters for the suspected cause of organic enrichment/low dissolved oxygen (DO). Reevaluation of extensive DO data provided by Smurfit-Stone Container Corp. (SSCC) has provided additional evidence that the Dugdemona River is not impaired by low DO. The previous petition to delist omitted data from the most recent year of SSCC's data collection effort for 2001. Because LDEQ did not sample the Dugdemona River in 2000 or 2001, the SSCC data represents a significant increase in the number of samples available for consideration. Updating the assessment to include 2001 data resulted in full support of all four SSCC sample sites along the Dugdemona River. As with our initial request, the following petition to delist describes LDEQ's reasoning behind this request. Raw data upon which this assessment is made is included on a diskette.

If you have any questions concerning this revised petition or the data associated with it please contact Mr. Albert Hindrichs at (225) 765-0246. Thank you for your consideration of this matter.

Sincerely,

Robert P. Hannah, Administrator
Environmental Planning Division

c: Willie Lane
Forrest John

RPH:aeH

**Revised Petition to Remove Organic Enrichment/Low Dissolved Oxygen as a
Suspected Cause of Impairment for the Dugdemona River-Subsegment 081401:
Louisiana's Court Ordered Section 303(d) List**

Introduction

The Louisiana Department of Environmental Quality (LDEQ) hereby requests that Dugdemona River, headwater to junction with Big Creek (subsegment 081401) be removed from EPA's Court Ordered § 303(d) list of impaired waters for the suspected cause of organic enrichment/low dissolved oxygen (DO). Reevaluation of LDEQ's ambient DO data, extensive DO data provided by Smurfit-Stone Container Corp. (SSCC), historic rainfall data, and on site surveys of the Dugdemona watershed led to the conclusion that the Dugdemona River is not impaired by low DO. Any reduction in DO below the promulgated site-specific criterion of 5 mg/L from November-April and 3 mg/L from May-October are the result of natural geographic, hydrologic, and climatological forces. The following petition to delist describes LDEQ's reasoning behind this request. Raw data upon which this assessment is made is included on a diskette.

Description of the Dugdemona River

Physical Description and Monitoring Sites

Dugdemona River, subsegment 081401, flows from its headwaters in Bienville and Jackson Parishes to the junction with Big Creek in Winn Parish, northwest of Winnfield, Louisiana. Headwaters consist of the merging of Little Dugdemona River and Big Cypress Creek, along with their associated minor tributaries. Length of the river within the subsegment is 48 miles. Beyond subsegment 081401 the Dugdemona River continues as subsegment 081402 from the junction with Big Creek to Little River. There are currently three sites located within subsegment 081401. These are described in Table 1. Site 0802 was initiated in 1999 as part of LDEQ's rotating basin monitoring approach. As a result, site 0802 only has 12 months of data available. Sites 0020 and 0078 were discontinued in May 1998, thus limiting the available data for these two sites to 38 samples each. The rotating basins approach was initiated in June of 1998.

Table 1. Current and historical sampling locations for Louisiana's ambient water quality monitoring program listed from upstream to downstream.

Site number	Site description	Latitude	Longitude
0078	Dugdemona River at State Highway 147 northwest of Hodge, LA	321655	924420
0020	Dugdemona River at State Highway 126 northwest of Dodson, LA	320722	924824
0802	Dugdemona River at Carter Crossing Road southwest of Dodson, LA	320121	924624

Prior Assessments

Subsegment 081401 was listed on the Court Ordered § 303(d) list based on Louisiana's 1998 § 305(b) report. At that time the DO criterion was considered impaired because 10.9% of samples fell below either the 3 mg/L or the 5 mg/L site-specific seasonal DO criterion. Because site-

specific criteria were available for this subsegment, the EPA assessment method of impairment occurring when >10.0% of samples exceed criteria was used. Reported impairment occurred at site 0078. Site 0020 was considered fully supported. The 1996 § 305(b) report showed full support for both sites 0078 and 0020. The 1994 § 305(b) report, prior to establishment of site-specific criterion, showed partial support at site 0078 and full support at site 0020. Because site-specific criteria had not been established in 1994 the DO criterion at the time was 5.0 mg/L. Site 0078 is near the headwaters of the river and site 0020 is near the bottom of the subsegment. In the 1992 § 305(b) report site 0078 was listed as not supporting DO, while site 0020 was listed as partially supporting DO. Again, this was prior to establishment of site-specific criterion.

As can be seen by the preceding discussion, even when using the original 5.0 mg/L DO criterion there is a pattern of the upstream site, 0078 not supporting the criterion while the downstream site, 0020, supports or partially supports the criterion. After promulgation of site-specific criterion, both sites 0078 and 0020 fully supported the revised criterion in 1996. But even then, site 0020 showed no samples below the criterion, while site 0078 showed 8.0 % of samples fell below the site-specific criterion.

Recent Monitoring and Assessment Methodology

All monitoring conducted by LDEQ was done in accordance with established quality assurance project plans for Louisiana's surface water monitoring program. Samples were collected on a monthly basis, with most samples being collected prior to 12:00 pm. The current water quality assessment is taken from the 2000 § 305(b) report, which is the most recently completed assessment for this water body. Data for the 2000 § 305(b) report was collected from January 1995 – December 1999.

The assessment method used for the 2000 § 305(b) was EPA's traditional percentage based method whereby if $\leq 10.0\%$ of samples fall below the criterion uses associated with that criterion are considered fully supported. If 10.1%-25.0% of samples are below the criterion the use is considered partially supported. If >25.0% of samples are below the criterion the use is considered not supported. EPA methodology was used because the subsegment in question has site-specific DO criterion.

SSCC provided LDEQ a large dataset containing daily testing for DO at four locations along the Dugdemonia River. SSCC's data and collection methodology were reviewed by LDEQ personnel and found to meet LDEQ's QA/QC requirements. The SSCC dataset extended from January 1995 through December 2001. However, in order to coincide with LDEQ assessment methodology only the most recent five-years of data, January 1997 through December 2001 was used. Although data was collected daily rather than monthly, LDEQ used EPA's assessment method when analyzing the data supplied by SSCC.

Table 2. Dissolved oxygen sample sites used by Smurfit-Stone Container Corp. (SSCC) and corresponding Louisiana Department of Environmental Quality (LDEQ) monitoring sites for Dugdemona River.

SSCC site description	LDEQ site number
Dugdemona River at State Highway 147 near Hodge, LA	0078
Dugdemona River at State Highway 4 near Danville, LA	None
Dugdemona River at State Highway 126 near Midway, LA	0020
Dugdemona River at Carter's Crossing SW of Dodson, LA	0802

Assessment Results for 2000 § 305(b) Report

Dugdemona River, 081401, was assessed as part of the 2000 § 305(b) Report using three LDEQ ambient sample sites as noted in Table 3. Two of three sites were fully supporting DO criteria while the third site, 0078 near Hodge, LA was not supporting DO criteria by 5.8%. Site 0078 is located approximately midway along the length of the subsegment and upstream of the town of Hodge. As a result, it primarily represents drainage from headwater streams and bayous, much of which is low-lying, bottomland hardwood swamps. Thirty-eight samples collected from January 1995 to April 1998 were used to assess site 0078. 1995 and 1998 sampling did not result in any criteria failures for DO. However, DO fell below the criteria for July, September and November 1996, then again in July, September and October 1997. Full results from analysis of LDEQ DO data for the Dugdemona River are shown in Table 3.

Table 3. Dissolved oxygen assessment of Louisiana Department of Environmental Quality data for Dugdemona River, subsegment 081401, based on 2000 § 305(b) Report. Sites are arranged from upstream to downstream.

LDEQ Site number	LDEQ Site Name	N	Min.	Max.	Median	Percent Exceedance	Use Support
0078	Dugdemona River near Hodge, LA	38	1.5	12.5	5.9	15.8%	Partial
0020	Dugdemona River NW of Dodson, LA	38	3.3	11.3	6.0	2.6%	Full
0802	Dugdemona River SW of Dodson, LA	12	2.6	9.2	6.1	8.3%	Full

Justification for Removal of Organic Enrichment/Low Dissolved Oxygen as a Suspected Cause of Impairment for Subsegment 081401

Climatological Support for Delisting of Low Dissolved Oxygen

Drought records for 1995-1997 were not available from the National Oceanic and Atmospheric Association (NOAA) Website. However, it is believed that Louisiana was moving toward a generalized drought during the years 1996, 1997 and early 1998. NOAA maps indicate moderate drought conditions began in the Dugdemona region in June 1998. As a result, low rainfall is believed to have played a significant part in the low DO levels observed on the Dugdemona River at site 0078 near Hodge, LA. Shreveport, LA, the nearest site for climatological records in

the Dugdemonia River area, was used to determine precipitation rates for the area. Shreveport is located approximately 61 miles west northwest of Hodge and approximately 54 miles west of the highest headwater stream for the Dugdemonia River. Weather patterns for Louisiana generally move from northwest to southeast. As a result, rainfall patterns in Shreveport are likely to be similar to those found a few miles to the southeast.

While precipitation data for 1996 is not readily available, review of 1997 records for Shreveport, LA showed the months of July and September were below normal for rainfall. Low DO was recorded at site 0078 for July 1997, September 1997, and October 1997. July was nearly 2.0 inches below normal for the month, with only 0.55 inches of rainfall during July prior to the sample data of July 15, 1997. September was 0.71 inches below normal with only 0.27 inches of rain falling during the month prior to the sample date of September 9, 1997. In August, no rain fell from the 23rd through the 31st. As a result, only 0.27 inches of rain fell for 18 days prior to the September sampling event. October was above normal for rainfall, with 2.31 inches of rain falling during the month prior to the sample date of October 9, 1997. A total of 2.33 inches fell during the previous 14 days before the sample event, with two days of rainfall accounting for 1.97 inches of the total. A rainfall of this magnitude would probably result in a rapid rise, followed by a fall in water levels of area streams. A rapid rise and fall is unlikely to affect long-term DO levels impacted by long periods of low flow.

Hydrologic Support for Delisting of Low Dissolved Oxygen

LDEQ Survey Information

Hydrology of Dugdemonia River near Hodge and Jonesboro, Louisiana is complicated by a combination of intermittent flow conditions upstream of Hodge and predominantly low flow conditions downstream. Much of the river is a swamp-like stream, which experiences intermittent flow during critical conditions in summer and early fall months (Law Engineering, 2002). Headwater tributaries above Hodge frequently pool up or become dry during critical periods, and many water bodies in this area have 7Q10 values of 0.0 cubic feet per second (cfs) (LDEQ, 2001; Lee, 2000). Critical conditions were set at the default summer 7Q10 of 0.1 cfs for headwaters and tributaries included in the LDEQ TMDL model, LA-QUAL (LDEQ, 2001).

Third Party Data Support for Delisting of Low Dissolved Oxygen

Smurfit-Stone Container Corporation's Hodge Mill records DO at four locations along the Dugdemonia River as part of their permit requirements. This data was submitted to LDEQ in support of efforts to delist low DO as a suspected cause of impairment to the Dugdemonia River. When this data was assessed using the same process as is used for LDEQ's ambient data all four sample points showed full support of seasonal DO criteria (Table 4). Refer to Table 3 for corresponding LDEQ assessment results.

Table 4. Dissolved oxygen assessment of Smurfit-Stone Container Corp. (SSCC) data for Dugdemona River, subsegment 081401, based on data from January 1997-2000. Sites are arranged from upstream to downstream.

SSCC Site Name and Location	Matching LDEQ Site*	N	Min.	Max.	Median	Percent Exceedance	Use Support
Dugdemona River at State Highway 147 near Hodge, LA	0078	1,826	1.3	12.6	6.3	6.4%	Full
Dugdemona River at State Highway 4 near Danville, LA	None	1,826	2.5	11.5	5.7	2.7%	Full
Dugdemona River at State Highway 126 near Midway, LA	0020	1,825	2.2	11.9	6.0	0.8%	Full
Dugdemona River at Carter's Crossing SW of Dodson, LA	0802	1,765	4.3	12.4	7.9	1.3%	Full

*Three LDEQ and SSCC sample sites are located at the same bridge crossings along the Dugdemona River.

Conclusions

Dugdemona River, subsegment 081401, was listed as impaired on Louisiana's Court Ordered § 303(d) list and 2000 § 305(b) report due to low dissolved oxygen. This impairment was based on site 0078 near Hodge, LA. Sites 0020 northwest of Dodson, LA and 0802 southwest of Dodson, LA indicated full support of DO criteria.

Historical and recent LDEQ data assessments for the Dugdemona River showed that DO upstream of Hodge is normally low relative to the two sites downstream of Hodge. LDEQ site 0078 was the only one of three LDEQ sites that failed to support seasonal DO criteria for the 2000 § 305(b) report. Below Hodge DO criteria were fully supported at two LDEQ sites. However, preceding documentation has shown that site 0078 is located in an area of naturally occurring low flow and swampy conditions. In addition, rainfall records for the 1995 –1999 assessment period showed the presence of developing drought conditions and low rainfall for several days prior to at least three of six monitoring events for DO; monitoring events which resulted in the water body's being considered impaired due to low DO.

Data collected by SSCC from 1997 – 2001 as part of their permit requirements showed that DO was fully supportive of seasonal DO criteria at all four of their monitoring sites on Dugdemona River. Because this SSCC data represents three additional years beyond the LDEQ data collection it is considered more representative of current conditions on the Dugdemona River.

Louisiana water quality regulations state that conditions of low DO resulting from natural conditions cannot be considered a cause of impairment. Louisiana Administrative Code (LAC)

33:IX.1107.B states that, “Since aquatic systems receive organic and inorganic materials from natural and man-made sources and receive physical inputs from natural and man-made sources, due allowances will be made for situations where low dissolved oxygen concentrations or other water quality conditions *attributable to natural sources* are at variance with the standards. To allow for such situations, the numerical criteria will not be applied below the 7Q10 or other appropriate critical flow as defined in LAC 33:IX.1115.C.” As noted above, the flow at LDEQ site 0078 was likely to be at or near 0.0 cfs at the time of DO monitoring by LDEQ. LDEQ’s TMDL report stated that the flow at this site in August 2000 was 0.0 cfs and the river channel upstream was pooled and not flowing.

LAC 33:IX.1113.C states that, “Although *naturally occurring variations in water quality may exceed criteria*, water quality conditions attributed to human activities must not exceed criteria when flows are greater than or at critical conditions (as defined in LAC 33:IX.1115.C).” This indicates that naturally occurring variations in DO that exceed criteria are allowed for under Louisiana regulations.

LAC 33:IX.1115.B states that, “Except where indicated elsewhere in this Chapter, the water quality standards specified herein shall apply during all flow conditions *greater* than the critical flows defined in LAC 33:IX.1115.C.” Because the flow at LDEQ site 0078 was likely at or below critical conditions at the time of sampling by LDEQ, subsequent water quality assessments should not utilize DO results obtained under these conditions.

In conclusion, based on the preceding documentation LDEQ hereby requests that the suspected cause of organic enrichment/low dissolved oxygen be removed from the State’s Court Ordered § 303(d) list for the Dugdemona River – Headwaters to Big Creek, subsegment 081401.

Bibliography

Law Engineering and Environmental Services, Inc. 2002. Final report: Technical Review of the Louisiana Department of Environmental Quality proposed Dugdemona River (Headwaters to the junction with Big Creek) watershed TMDL for biochemical oxygen-demanding substances and nutrients. Prepared for Smurfit Stone Container Company, Hodge Mill, Hodge, LA. January 2002.

LDEQ. 2001. Dugdemona River (Headwaters to the junction with Big Creek) Watershed TMDL for biochemical oxygen demanding substances and nutrients. Subsegment 081401. Louisiana Department of Environmental Quality, Office of Environmental Assessment, Environmental Technology Division, Engineering Group 2. Baton Rouge, LA. November 16, 2001. 49pp.

Lee, F.N. 2000. Low-flow on streams in Louisiana. Louisiana Department of Environmental Quality. Baton Rouge, LA. March 2000.